Solid State Lighting (SSL)
Market Conditions and Opportunities
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Energy Challenges

- Energy Action Plan established cost effective, reliable Energy Efficiency (EE) and Demand Response (DR) resources to precede other supply side resources in the “Loading Order”
- EE permanent energy reductions resulting in kWh savings
- DR – Dispatchable loads (1000 mW)
  - Reliability
  - Economic dispatch

CPUC 2006-08 Approved Targets

IOU	2006			2007			2008		
	GWh	MW	MMTh	GWh	MW	MMTh	GWh	MW	MMTh
SCE	922	220	-	1,046	227	-	1,167	253	-
PG&E	829	180	13	944	205	15	1,053	229	17
SDG&E	281	61	3	285	62	3	284	62	4
SCG	-	-	15	-	-	19	-	-	23
Total	2,032	441	30	2,275	494	37	2,504	543	44

- Targets do not include savings from third parties
- Very aggressive ramp-up of program activities
- Savings goals for 2009-20013 are beyond the technical potential
- 55-60 percent of the IOU's incremental electric energy needs through 2013 EE

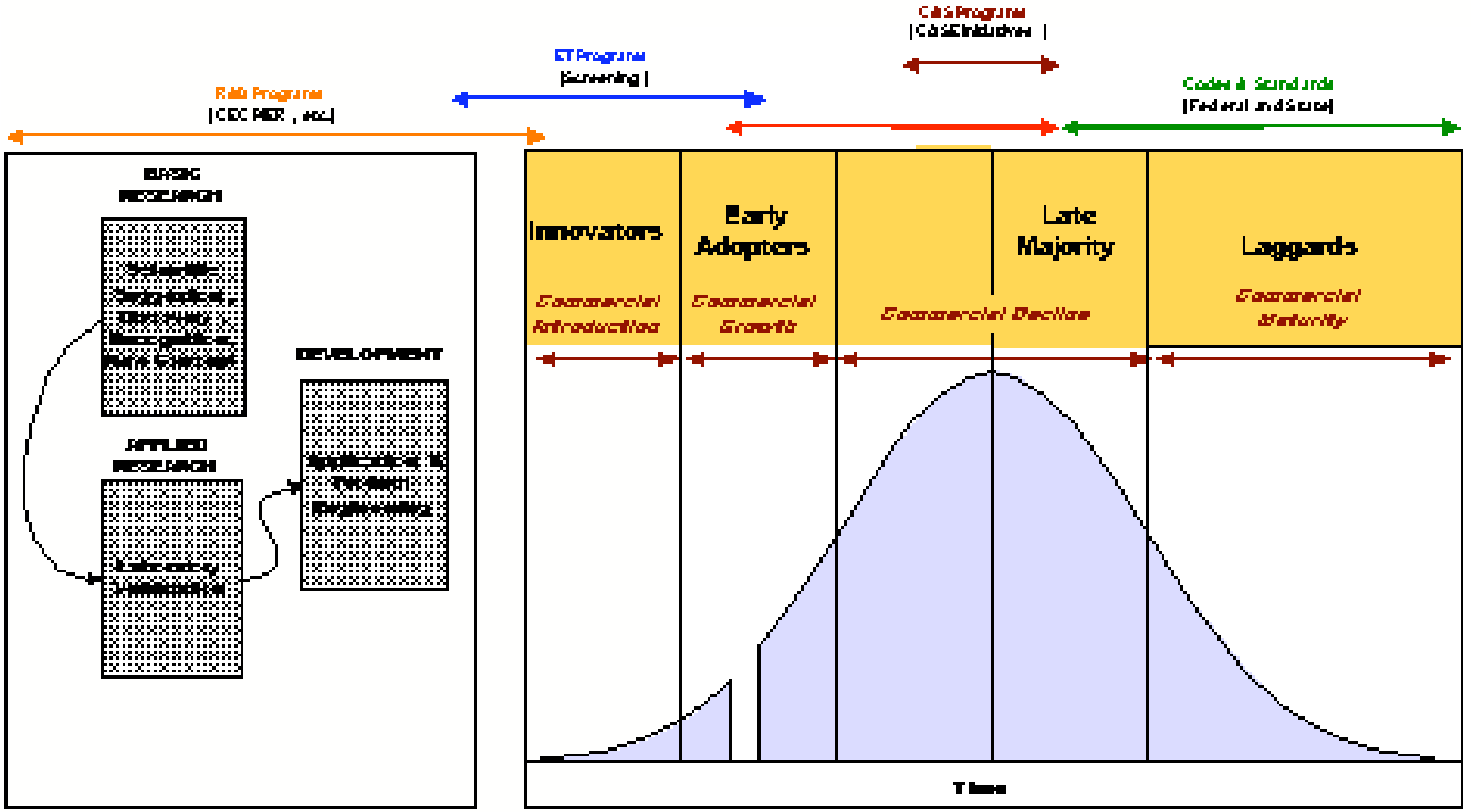
Opportunities

- Budgets dramatically increased to nearly $1 Billion annually (EE/DR statewide).
- Energy efficiency innovations are valued pursuant to total resource cost evaluations.
- The time-dependent value of energy now recognized by California and adopted into new 2005 Standards.
- Utility profits unbundled from kWh sales for all California IOUs.
- Shareholder earnings
- Cost recovery mitigated

Opportunities (continued)

- Lighting consumes approximately 30 percent of kWh.
- Approximately 50 percent of the EE potential in the commercial sector comes from interior lighting.
- Market intelligence for pre-commercial or new innovations is frequently lacking.
- Commercial technical potential for indoor lighting is large.

California PGC Model of Product Commercialization



Energy Efficient Technology Commercialization Process

Solid State Lighting is Important

- Wide range of possibilities
  - Homes
  - Offices
  - Retail
- Edison currently assessing a wide range of technologies
  - “OPEN” Signs for retail stores
  - Down-lights for residential
  - Reach-in Refrigerated Display Case Lighting for supermarkets
  - LED Hybrid Porch Light and Pathway Lights for residences and communities
  - LED Taxiway Lighting for airport runways

LED “OPEN” Signs for Retail Stores

Neon

LED

LED

Neon

LED

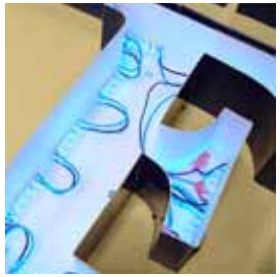
67% Savings

Average neon sign: 46W
Average LED sign: 15W

LED Downlights for Residential Applications

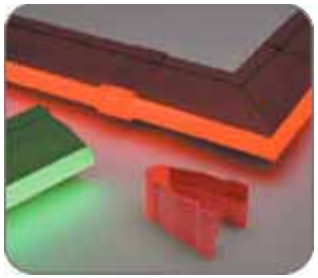
9W Dimmable Downlights

LED Illuminated Channel Letter Signs



Red LED's are known to be more efficient than Red Neon, but other color LED's are just now being tested by SCE

LED Architectural Border Tubing for Buildings



LED Under-Cabinet Lighting for Residential and Hospitality Markets

LED Reach-in Refrigerated Display Case Lighting for supermarkets

LED Hybrid Porch Light and Pathway Lights for Residences and Communities

Typical yearly energy saved:
214 kWh / fixture

Built-in occupancy & photocell activates primary incandescent/CFL

LED Taxiway Lighting for airport runways

42W of incandescent to 6W dimmable LED to accommodate taxiway modulation requirements

LED Streetlights

Getting closer…